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Perineal urethrostomy in a cat following prepuce and perineal region injury

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Abstract

A 2- year- old male, intact domestic short hair cat was referred to the Veterinary Teaching Hospital, Ferdowsi University of Mashhad, with a history of inappetence, vomiting, dysuria, stranguria, depression and continuous urine leakage from the skin injury in perineal region. On physical examinations, temperature, pulse and capillary refill time (CRT) were decreased and pale mucosal membranes and dehydration were observed. Palpation of the abdominal region was painful and kidneys were enlarged. Penis was not present in its normal anatomical position.

In biochemical analysis, significant rise in BUN (blood urea nitrogen) and creatinin were noticed. In abdominal radiographs and ultrasonography evaluations distention of the urinary bladder and blockage in urinary tract were identified. According to these results presence of an obstruction was confirmed in the penile urethra, and consequently, perineal urethrostomy (PU) was performed for correction of obstruction and renewed urine outflow. Normal urination established in our patient after PU surgery and common post surgery complications did not occur.

Keywords: cat, penile urethra obstruction, perineal urethrostomy

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Introduction

Urethral obstruction commonly occurs with a high mortality rate in male cats (Mendham, 1970). The most important causes of urethral obstruction are urinary calculi, presence of mucoid and inflammatory plagues due to bacterial and viral infections in urinary tract and stricture in the penile urethra as a result of injuries, congenital defects, trauma and tumors (Saroglu *et al.*, 2003; Little, 2007). In cats with urethral obstruction, the most common clinical signs are hematuria, dysuria, stranguria, pollakiuria, and anuria. Depression, weakness, vomiting, appetite decrease, dehydration, perineal alopecia and abdominal pain may be observed too (Osborn *et al.*, 1991; Kalkstein *et al.*, 1999; Nelson and Couto, 2003; Bass *et al.*, 2005). Patient history, physical examinations, blood and urine analysis, abdominal x-rays and ultrasonography evaluations, can be useful to determine the patient's disease status and suitable therapeutic method (Nelson and Couto, 2003).

Therapeutic strategies which should be considered are fluid therapy, urethral catheterization, cystocentesis, penile urethra massaging, rethrohydropulsion and urethrotomy. Medical management and food correction can also be useful (Osborn *et al.*, 1996a; Saroglu *et al.*, 2003; Nelson and Couto, 2003; Bass *et al.*, 2005; Acar *et al.*, 2010). While these treatments are not successful or obstruction recurs, surgical intervention is indicated (Mendham, 1970; Griffin and Gregory, 1992; Osborn *et al.*, 1996a; Macloughin, 2000; Saroglu *et al.*, 2003; Acar *et al.*, 2010).

Several urethrostomy techniques can be performed in male cats, but perineal urethrostomy (PU) is preferable for penile urethra obstruction (Peixoto *et al.*, 1997; Smeak, 2010). PU is also indicated for feline urogenital syndrome (FUS), severe trauma and conditions that may require amputation of the penis, such as preputial, urethral or penile neoplasia (Fossum, 2007).

This article describes the clinical features, treatment and outcome of a case of penile urethra obstruction following healing of perineal wound in a cat.

Case presentation

A 2- year- old male, intact domestic short hair cat, with a 3 months history of perineal region injury, anorexia, vomiting, stranguria, and lethargy was referred to the Ferdowsi University of Mashhad, Veterinary Teaching Hospital (Fig.1). On physical examinations, the cat was hypothermic and dehydrated. He had also weak pulse and pale mucosal membranes with increased CRT. Palpation of the abdominal region was painful and kidneys were enlarged. The penis was not present in its normal anatomical position and urine leakage from the skin injury in perineal region was noticed.

In biochemical blood analysis, BUN, creatinine and bilirubin were markedly increased. PCV, fibrinogen, and alanine transaminase (ALT) enzyme were not within normal range either. The results of biochemical analysis and CBC are presented in table 1.

Table 1. The biochemical and hematological analysis.

Parameters	Patient	Normal Ranges
PCV (%)	48	24-45
Total White blood cells	9250	5500-19500
Neutrophils (Mature) (/µl)	8417	2500-12500
Neutrophils (Band) (/µl)	-	0-300
Eosinophils (/µl)	-	0-1500
Lymphocytes (/µl)	360	1500-7000
Monocytes (/µl)	463	0-850
Total Protein (g/dl)	8.5	5.4-8.7
Fibrinogen (mg/dl)	400	50-300
BUN (mg/dl)	74.25	20-30
Creatinine (mg/dl)	2.50	0.8-1.8
Bilirubin (T)	0.725	0.15-0.5
ALT (u/l)	168	30-100

In ventrodorsal view radiographs, size of the left and right kidneys were 2.5 and 3 times the length of the second lumbar vertebra (L2), respectively. The size of right kidney was near the border line of renal enlargement, whereas both kidneys should be the same size in a given

patient (Dennis *et al*., 2001). Mild renomegaly with smooth outline views was confirmed in the right kidney by radiography. Urinary bladder distention was noticed in radiographs (Fig. 2). In ultrasonography, mild hydronephrosis in the right renal pelvis, distention of urinary bladder with anechoic content and free fluid (urine) accumulation in perineal subcutaneous region was detected and urinary tract obstruction was confirmed. Perineal urethrostomy was performed to eliminate obstruction and renewed return urine outflow.

In order to restore normal electrolytes and hydration, intravenous fluid therapy was administered preoperatively. The patient was given a premedication of intramuscular acepromazine (0.03 mg/kg [Neurotranq®, Alfasan, Woerden-Holland]), and general anesthesia was induced by IV administration of diazepam (0.2 mg/kg [Zepadic®, Caspian tamin Pharmaceutical Co., Rasht, Iran]) and ketamine (6 mg/kg [Ketalar®, Alfasan, Woerden, Holland]) combination. Following intubation, anesthesia was maintained using isoflurane (1.5 to 2%, [Nicholas Piramal Limited, London, UK]) delivered in 100% oxygen.

The cat was placed in the Treinberg position, and perineal area surgically scrubbed and prepared. Castration was performed through an elliptical incision around the scrotum and prepuce initially. Penis was located in granular tissue of perineal region, which was dissected sharply and bluntly from the surrounding connective tissues. The bilateral ischiocovernosus and ischiourethralis muscles were identified and incised at the ischium. Penis dissection was continued until it was free from all its attachments. The retractor penile muscle on the dorsal part of the penis was cut until the balbourethral glands and penile urethra were observed. Then a urinary catheter was passed into the urethra and under the guidance of the catheter, urethra was incised approximately 3 cm on the dorsal side. The urethral mucosa was anastomosed to the perineal skin region using 4-0 nylon suture in an interrupted pattern and finally the skin wound was closed (Fig. 3).

Cefazoline (22 mg/kg tid [Cefazex®, Loghman pharmaceutical Co., Tehran, Iran)]) have been administered preoperatively and continued for five subsequent days after surgery.

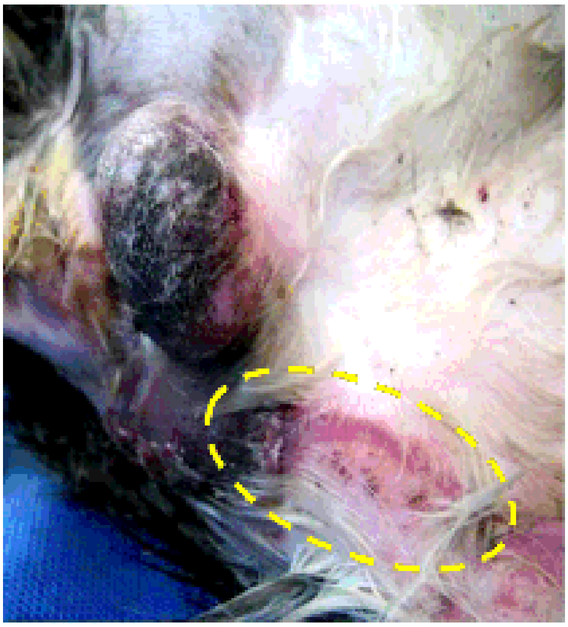


Figure 1. Preoperative aspect of the wound on the perineal region. Penis was not seen in its normal anatomical position and was completely covered with granulation tissue.



Figure 2. VD view of abdomen; note that the size of right kidney is near to border line of renal enlargement. Urinary bladder is distended with urine.

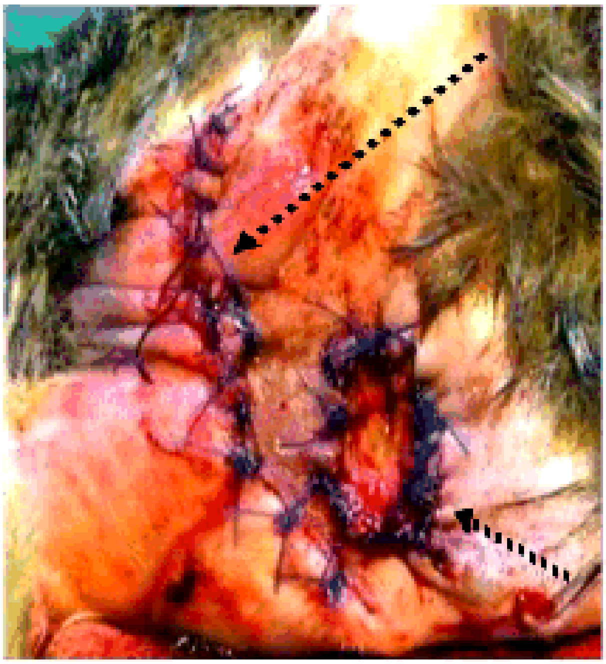


Figure 3. Appearance of the urethrostomy (short arrow) and the injury site (long arrow) closed using nylon suture.

Results and discussion

The patient was hospitalized for four days following the PU surgery. Appetite was recovered and urine outflow evacuation occurred from the urethrostomy orifice. In new blood and serum analysis, abnormal

parameters were clearly corrected compared to pre-surgical sample (Table 2).

The cat was re-examined 2 weeks post surgery for suture removal. There was no evidence of the urinary retention, dysuria and hemorrhage. Also wound dehiscence or edema in operation site was not observed.

Table 2. Clinical pathology evaluation of patient 4 days post operation.

Parameters	4 days after PU	Normal Ranges
PCV (%)	32	24-45
Total Protein(g/dl)	6.9	5.4-8.7
Fibrinogen(mg/dl)	300	50-300
BUN(mg/dl)	20.32	20-30
Creatinine(mg/dl)	1.47	0.8-1.8
Bilirubin(T)	0.67	0.15-0.5
ALT(u/l)	118	30-100

Even though PU is a simple technique, some complications may occur during and after operation. Hemorrhage is one of the complications that may occur during or post surgery. Self trauma may be one of the causes of post surgery hemorrhage (Slatter, 2003), although it didn't occur in this patient.

Contact between urine and perineal skin can cause irritation dermatitis (Saroglu *et al*, 2003; Acar *et al*, 2010). Vaseline ointment was rubbed around the surgery site for prevention of skin dermatiatis and wound dehiscence.

Stricture is the most serious post surgery complication of PU (Fossum, 2007). Narrowing of the urethrostomy orifice may occur due to incomplete dissection, urine leakage under the skin and granulation formation (Fossum, 2007). Growing of the perineal hair also could play a role in stricture formation (Saroglu *et al*, 2003; Acar *et al*, 2010). Incidence of this defect in PU method is more than to other urethrostomy techniques (Bernard and Viguir, 2003). Stenosis formation could be developed between 3 weeks to several months after surgery (Bass *et al.*, 2005; Acar *et al.*, 2010). Stricture of the new orifice was reported in 18% cats, that had been taken under PU (Geregory and Vasser, 1983; Bernard and Viguir, 2003) but the rate of 10% was also reported (Bass *et al*, 2005). In the presented patient, stricture had not been developed up to several years after surgery.

Urinary incontinence (UI) after PU is also a common consequence. Different reports have showed UI incidence rates varying from 0% to 7% after PU (Bernard and Viguir, 2003). This defect may occur due to nerve damage around the urethral sphincter (Bernard and Viguir, 2003; Slatter, 2003). Neuronal damage can also result in fecal incontinence, although it did not happen in the presented cat.

Urinary tract infection (UTI) and bacterial cystitis are common problems, because of the prepuce removal, subsequent direct exposure of the urethral orifice and shortening of the urethra (Slatter, 2003). UTI usually is a long-term complication after PU (Bernard and Viguir, 2003). Postsurgery antibiotic therapy can be useful for solve this problem. The numerous studies have showed that the UTI rate varies from 9% to 53% after PU (Gregory and Vasseur, 1983; Griffin and Gregory, 1992; Bernard and Viguir, 2003; Bass *et al*, 2005; Corgozinho *et al*, 2007). No infection was seen in our patient during long term post operation observation.

Dysuria, pollakiuria, hematuria, perineal swelling, wound dehiscence, urine leakage, recurrent feline lower urinary tract disease (FLUTD), rectovaginal fistula and tissue necrosis are other complications that may occur with various rates from a few days to several months after perineal urethrostomy (Osborn *et al.*, 1991, 1996b; Griffin and Gregory, 1992; Smith, 2002; Slatter, 2003; Bernard and Viguier, 2003; Saroglu *et al.*, 2003; Bass *et al.*, 2005; Corgozinho *et al.*, 2007; Fossum, 2007; Acar *et al.*, 2010; Tobias, 2010). The patient was followed-up for 2 years post-surgery, general conditions were normal along with weight gain. Operation site had been healed and the perineal hair had been grown. So in spite of various complications, perineal urethrostomy consistently showed a salvage and useful permanent method for cure in majority of cats with penile urethral obstruction and urinary blockage (Griffin and Gregory, 1992; slatter, 2003; Bernard and

Viguir, 2003; Saroglu *et al*, 2003; Bass *et al*, 2005; Fossum, 2007; Corgozinho *et al,* 2007; Acar *et al,* 2010).

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ایجاد منفذ ادراری (perineal urethrostomy) در گربه متعاقب جراحت ناحیه‌ی پرینه و غلاف قضیب

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چکیده

گربه‌ی نر۲ ساله‌ای از نژاد مو کوتاه و عقیم نشده با تاریخچه‌ای از بی‌حالی، بی‌اشتهایی، مشکل در دفع ادرار و مدفوع به کلینیک دانشکده‌ی دامپزشکی دانشگاه فردوسی مشهد ارجاع داده شد. در معاینات بالینی انجام شده دهیدراتاسیون، مخاطات رنگ‌پریده، کاهش دما و نبض ضعیف یافت شد. طی ارزیابی‌های بیشتر عدم مشاهده‌ی آلت تناسلی، نشت ادرار از جراحت پوست در ناحیه‌ی پرینه، درد و همچنین تورم کلیه‌ها در ملامسه‌ی شکمی مشاهده گردید. افزایش بارزی در مقادیر BUN و کراتینین در آزمایش‌های بیوشیمیایی به دست آمد. در ارزیابی‌های رادیولوژی و سونوگرافی، اتساع مثانه با ادرار و تجمع ادرار در بین بافت نرم قابل مشاهده بود. با توجه به مجموع یافته‌های به دست آمده و عدم پاسخ‌دهی بیمار به اقدامات درمانی انجام شده تصمیم به انجام جراحی perineal urethrostomy (PU) برای اصلاح انسداد و برقراری مجدد جریان ادرار گرفته شد. در معاینات مجدد، وضعیت عمومی حیوان بهبود چشمگیری داشت. خروج ادرار از منفذ جدید به سهولت انجام می‌گرفت و فاکتورهای بیوشیمیایی غیر طبیعی پیش از جراحی در محدوده طبیعی خود قرار گرفته بودند. ضمن این‌که مشکلات رایج پس از جراحی PU در این بیمار حتی در پیگیری‌های بعدی نیز مشاهده نگردید.

واژگان کلیدی: گربه، انسداد میزراه، ایجاد منفذ ادراری در ناحیه‌ی پرینه